NOTE-BOOK

Experimental Animal
Physiology.

Max Vorworn:—Physiologisches Praktikum.

Gustav Fischer, Jena.

Apr. 19.

Ionenwirkung

Literatur.

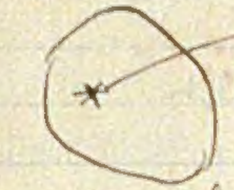
Höber: Physik. Chemie der Zelle u. Gewebe. 5. 587 — 5. 692 (S. 641) Leipzig 1922.

Bayliss: Principle of gen. Physiology.

Spaeth: Journ. of Exp. Zool. Vol. 15. 1913.

海老原重: 京大. 医. 生理論文集 一.

第1篇 1色1実験



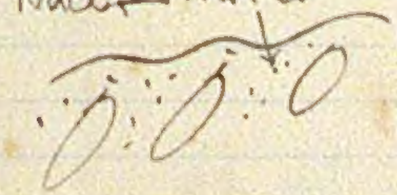
=ナカリ { 1. Melanophore. melanin 黒ヒ
2. Xanthophore. キトン 黄色.

色1ヲ1ツ chromatophore 1ツ ヲリ, ヲルヒ=ヨル

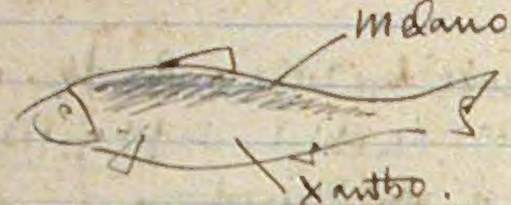
• contract ヒッコム

✶ expand ヒロガッテヲカーヲル.

NaCl ⇌ Na + Cl'



実験　材料　ハヤ・ボテ.



① NaCl 0.1 ~~isotonormal~~ =. expand する.

順序.

1. Destiert. Wasser.
2. NaCl 1M ㊍. 0.5 M ㊍. 0.1M. 0.05 M. 0.01 M.
   浸透圧, ㊍ 影響 ? 知る.
3. KCl. KBr. KNO$_3$. KCl. KSCN. / 0.1 M.
   K' は contrack. は anion / 抵抗 = 比. " 移動 in.
4. NaCl, NaBr, NaNO$_3$, NaI. 0.1 M.
5. KCl, NH$_4$Cl, LiCl, NaCl, 0.1 M
   cation / ハタラキ ? 知る.
6. NaCl < KCl 0.1 M.
   1 : x
7. Seewasser
   1, 3/4, 2/4, 1/4, 1/8

準備. NaCl, KCl 0.1 M / 溶液 1000 cc.
58.5 74.6.

NaCl 1M と 0.5M 500 c.c.

119 101 166 97.2 139 78.43
KBr, KNO$_3$, KI, KSCN, NaBr, ~~NaNO$_3$~~,
+2aq +2aq +2aq
NaI, NH$_4$Cl, ~~LiCl~~ 各 0.1 M ? 500 cc
186 53.5 78.43

→ ? 2 | 5.35 / 2.68 ? 両面 2

2 | 11.7 / 19 = 5.9

5.947 / 1.087 = 5.47

(14.87 gr.)

5.20 − 0.7 = 5.3

5.05 / 5.147 / 10.437

10.6

1.7

2 | 6.9 / 139 / 19

39.21 / 2 | 78.43 / 6 / 18 / 6 / 7

39 : 1

58.5

3.728 / 5.187 / 9.107 gr.

8. Ultra violett-Strahlen
contration
0.1 mol NaCl

9. Temperatur
注液→ゾル contraction
30°C

10. KCl 0.1
↓
NaCl
ゲル→ゾル→ゲル変→ expandsw

"ゲル系ニ少量ノ電解質ヲ加ヘテ膨潤セシムルコト

11. KCl . KNO_3

1%ヲ用ヒヨ

12. osmotisches Druck 0.5 0.25 0.1 0.05 0.001
Cane sugar
grape sugar

14 Atropin 1/0

Fundulus heterocliti ♀
l. ex. 200.

Apr. 20.

1. soon after removal — contract

2. 特徴 expansion for a time after removal

3. periphery gradually contracting

4. advancing to center

5 all contracted again

全体 約1/200 ロまで

10分 余り contract ヲ続ク

ソノ後ハ少シモ contract セズ

13分 ソノ半分 on contract ス

20分 dist. w. ヲカケルニ至ラズ

1時間 体全体ノ1/3ニ

24時間 原ニ近ク迄ヒロガル

再生ハ出来ナイ

たて二"

NaCl 濃度 0.5 mol / 1 mol

time, 0.4M, 0.1M, 0.1M

29分

33分

35分 エレベ 不均 expand

39分 一方向 expand 2エリア

49分 2/3方向 expand 1/2

1方向 expand 均等 expand

1エレベ 不均 1エリア

1エレベ 不均 1エリア

48分 孔左右に omit

18分

expand 1/3

一方向 expand

2一方向

→ 方向 全体 expand

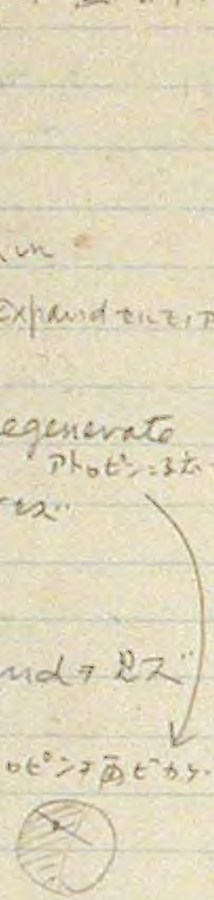
はず NaCl 0.1M

φ—7

Apr. 26.

(I) Material 7+. scale. 蒸溜水

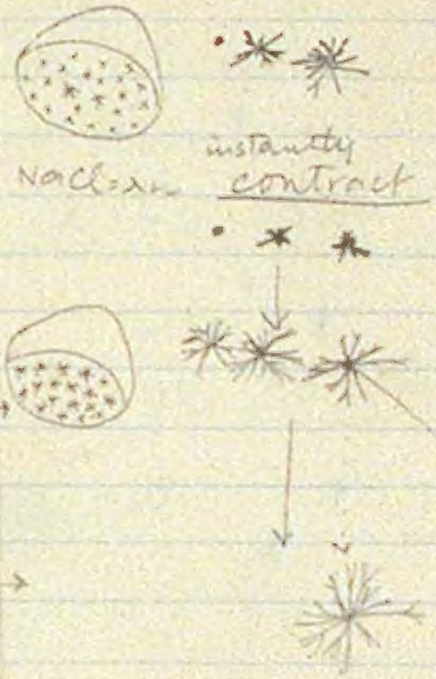
A.M. 1.55.	scale ｱﾘ"	
2.03	dist. wat. ｲﾚﾙ	
2.07	Expansion	
2.22		ｽｺｼ
2.24		Expand ｾﾇﾓﾉｱﾘ
2.30	Expand ｾﾇﾓﾉｽｺｼ	
2.50		degenerate Photo ﾆｽﾙﾓﾉﾓｱﾘ"
2.53	* self contractions"	
3.02		
3.05	* NaCl ｲﾚﾙ good expand ｽﾙ"	
3.14		ｱﾄﾛﾋﾟﾝﾃﾞ黒ｾﾞｶﾗ



Apr. 27

(II) 7+. NaCl+KCl.

		No. 1	No. 2	Note
A.M.	1.34	scale ｱﾘ"	"	
	1.45			
	1.48	KCl ｲﾚﾙ		
	1.52			
	1.57			
	2.03	→		
	2.08	→		
	2.29	→ contract ｽﾙﾓﾉｱﾘ		
	2.30	→		
	2.34	→ atropin		
	2.57	→ ｽｺｼ expand ｽﾙ		
	2.58	→ expand ｽﾙﾓﾉｱﾘ.		
	5.40	→ degenerate		



No. 2 ｾﾝﾍﾝ expand periphery ﾊﾓ ﾆｼﾃ contract

No. 1 ｴｷﾓ ﾓﾐﾃ contract

No. 2 ｴｷﾓ ﾓﾐﾃ expand

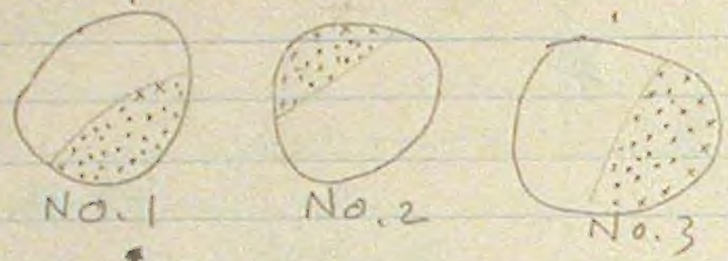
ﾆｭｳｶﾝ ﾓﾐﾃ expand ｼﾃｲﾙﾓﾉﾓｱﾘ

Apr. 27 → 標本ナシ

(III). NaCl / osmotisches Druck. 1, 0,5, 0,1

P.M. 1.34 Scale マハリ" melanophore ナシ.

2.24 melanophore ヌケ" 皆 contract 2



2.41 No. 1.

2.45 No. 1 ヲ 1M = ヘル

2.47 No. 2.

2.48 No. 2 ヲ 0.5M = ヘル

2.49 No. 3

2.50 No. 3 ヲ 0.1M = ヘル

2.54. No. 1 ヨセ + シ (13分位)

3.01 No. 2 稍 expand

3.03 No. 3 expand 大

3.09 No. 1 ヨセ + シ.

3.(12) 〃 ヨセズ No. 2

3.14 No. 3 モ = expand

Apr. 27

(II). 5分

P.M. 5.38 No. 1 ハ 42% ニテ

2 atropin ヲ 30ヲ

6.02 ヨセ ヲ 入レタ"

(III) / 5分

P.M. 5.47 No. 1 = ヨセ 3回 × 2 全ク ヨセズ

48 atropin ヲ 30ヲ

58 No. 2. 3.10 P.M ノ ヒキト 3回 ヨセヲ 与ヘル

57 No. 3

58 No. 1 ヨセ + シ

59 No. 2 = atropin ヲ 30ヲ

6.00 No. 3 ヲ KCl 1M ヘ = ヘル

6.05 No. 1 ハ ヨセ + シ

1 24 No. 2 ヨセ + シ

2分 No. 3 ハ contract 完全

May 3. 2%NaCl / A / B

3.30 scale 1m

3.40 scale 1m

3.07 B 2ml

3.08 NaCl = λ1m (No. 1)

3.10 A 2ml

3.12 $NaNO_3$ = λ1m (No. 2)

3.13 1m

3.15 NaBr = λ1m (No. 3)

4.38 No. 1 contract.

4.43 No. 2 変化なし

4.51 No. 3 〃

4.53 Atropin 1滴

4.50 No. 1 expand.

May 3 2%NaCl / scale 1m

A 5.10

5.15

5.17 NaCl = λ1m

5.10 $NaNO_3$ = λ1m

5.12

5.18 expend

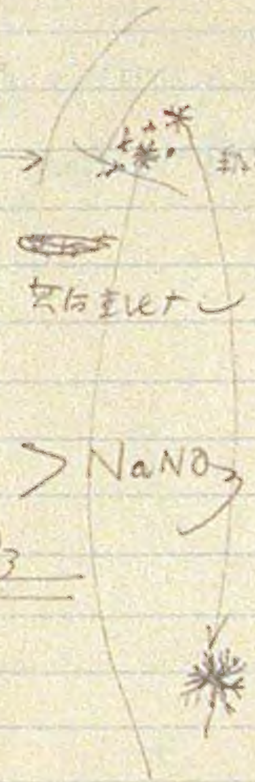
5.19 Br 変化なし

6.21

4.38 さらに変化なし

4.31

NaBr = λ1m



結果 NaCl > NaBr > $NaNO_3$

i.e. Cl > Br > NO_3

may. 4.

15. $BaCl_2$ 244.5 M/20

Overton E. 1904 frog's muscle irritability

Na > Li > Ca > NH_4 > K < Rb < K

Spath.

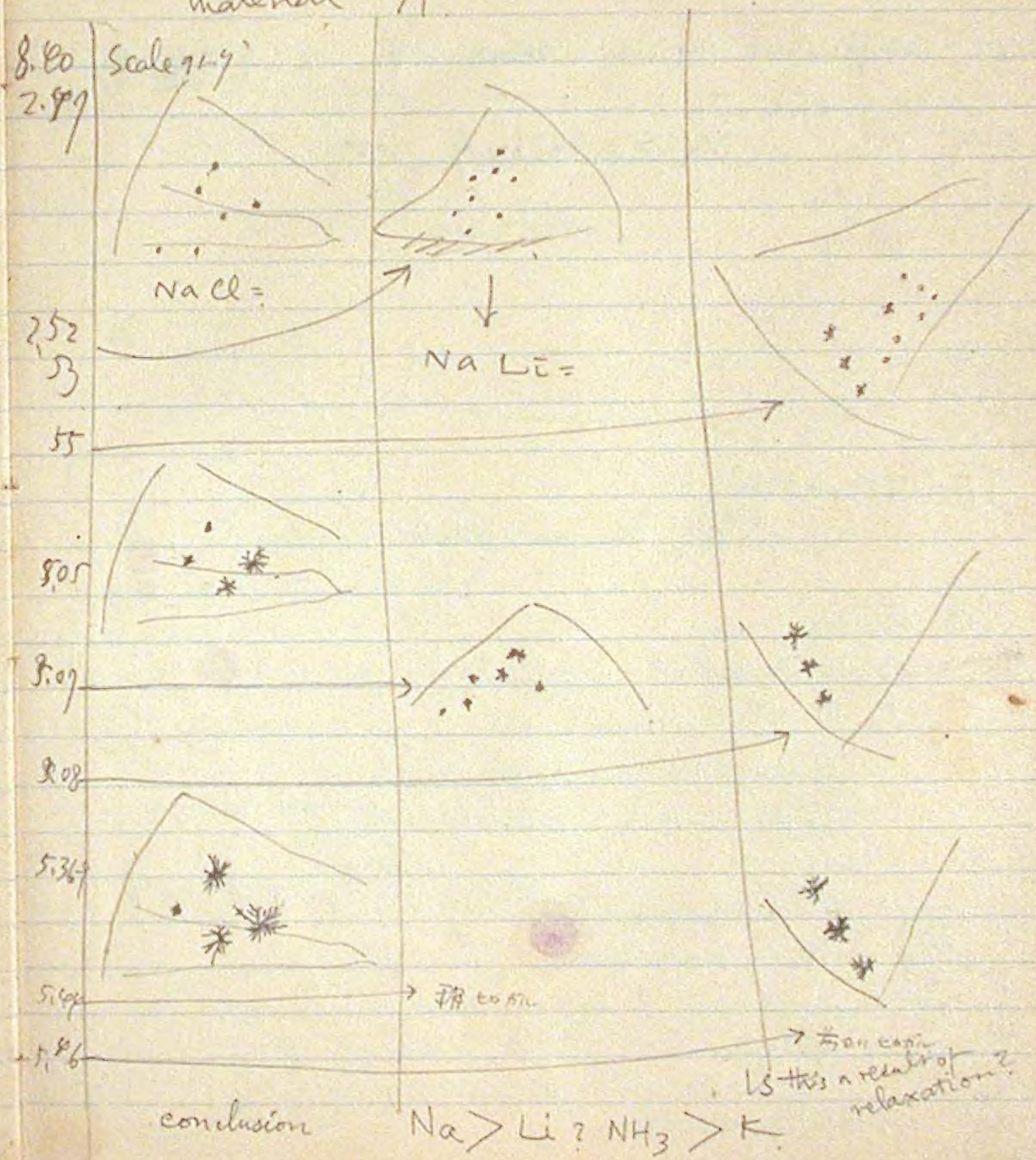
{K Rb > NH_3 Cs > Li > Na 7Na : 1K

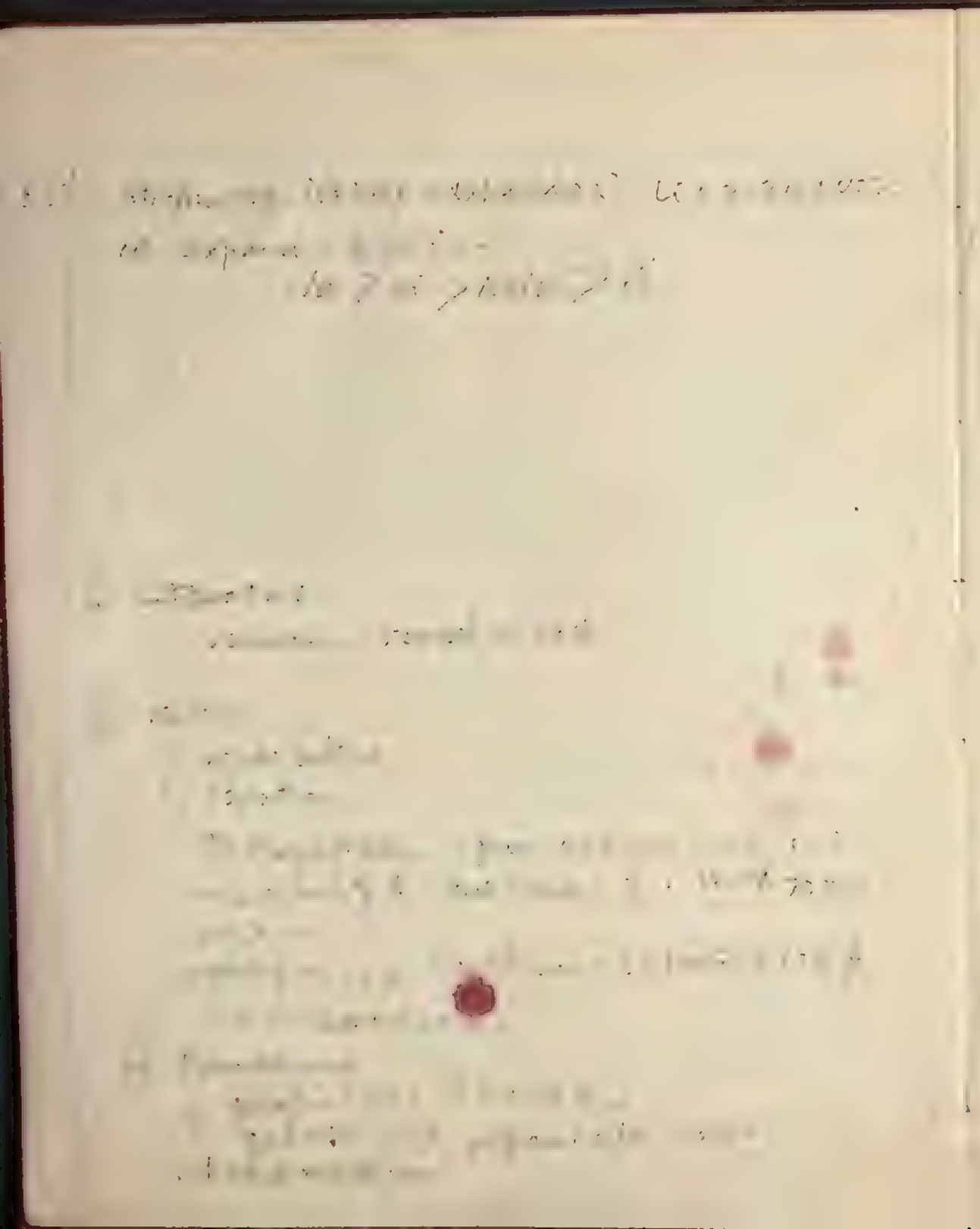
Hofmeister's lyphotrophic Series

SO_4 Tartrat. Zitral < ~~Oxy~~ Acetat < Cl < Br, NO_3 < I < SCN

may. 4. Kation, Wirkung, 性质

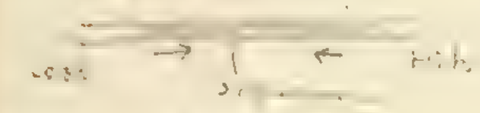
material 7t.



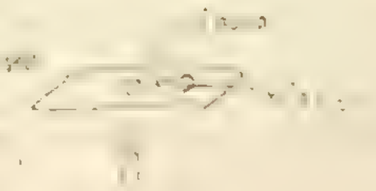


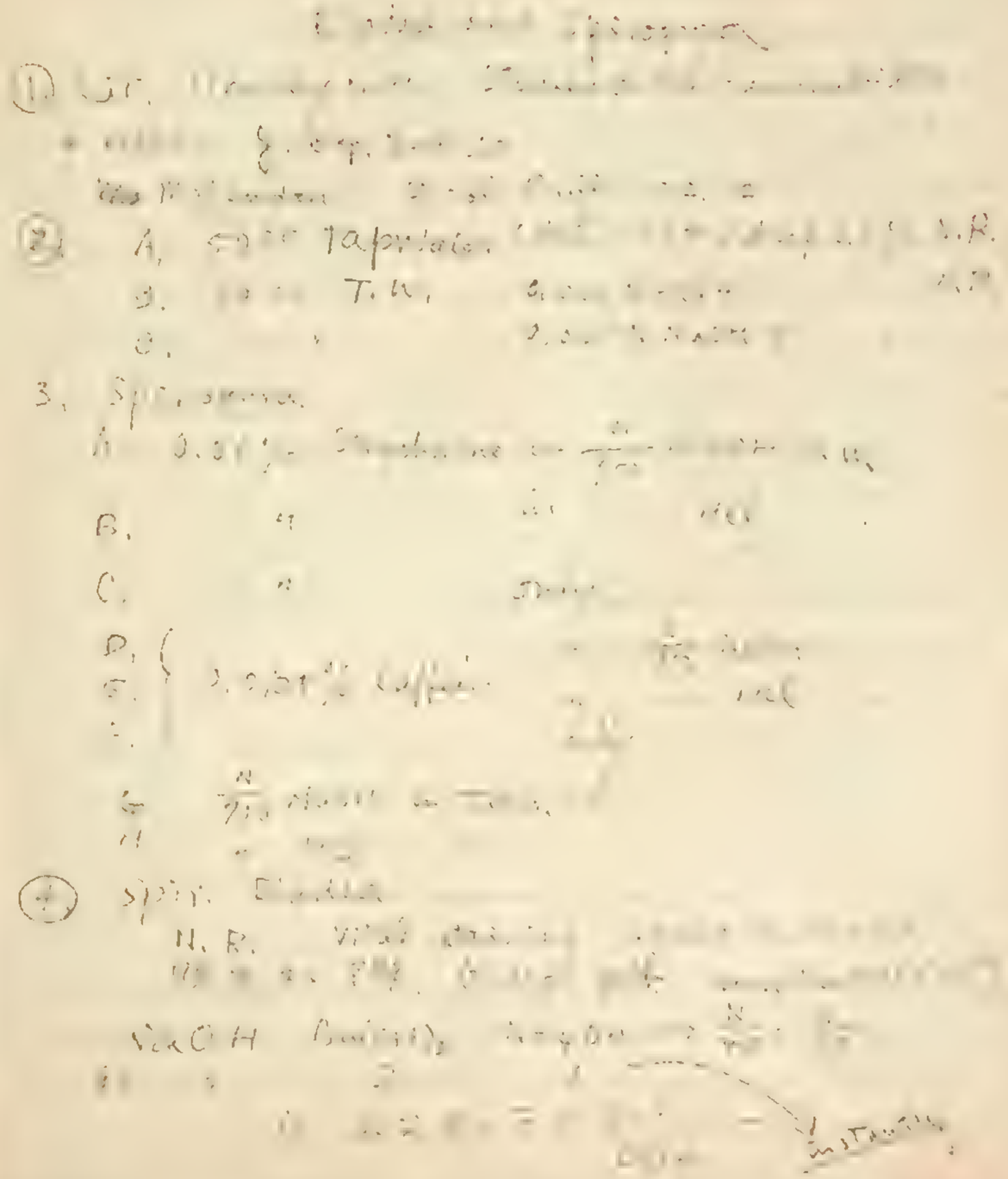
(2) K[illegible]
[illegible], HCl, [illegible]
Ultrapure Sand

3 Temperature



(4) Narkosis
11 Tricholoxytan
a) [illegible]





Juni, 10

Hämophilie

1. Cit: Adrenalin, Ionisierung, Histidin.

2: Kalziumchlorid.

100 Chlorcalcium + 7 Calciumlactat + Kalziumsalze

Wirkung: A. Cardiaca

3) Blutbestandteile

Blutplättchen — Blutplättchen

Blutzellen — Erythrozyten — Leukozyten

Blutserum — Fibrin

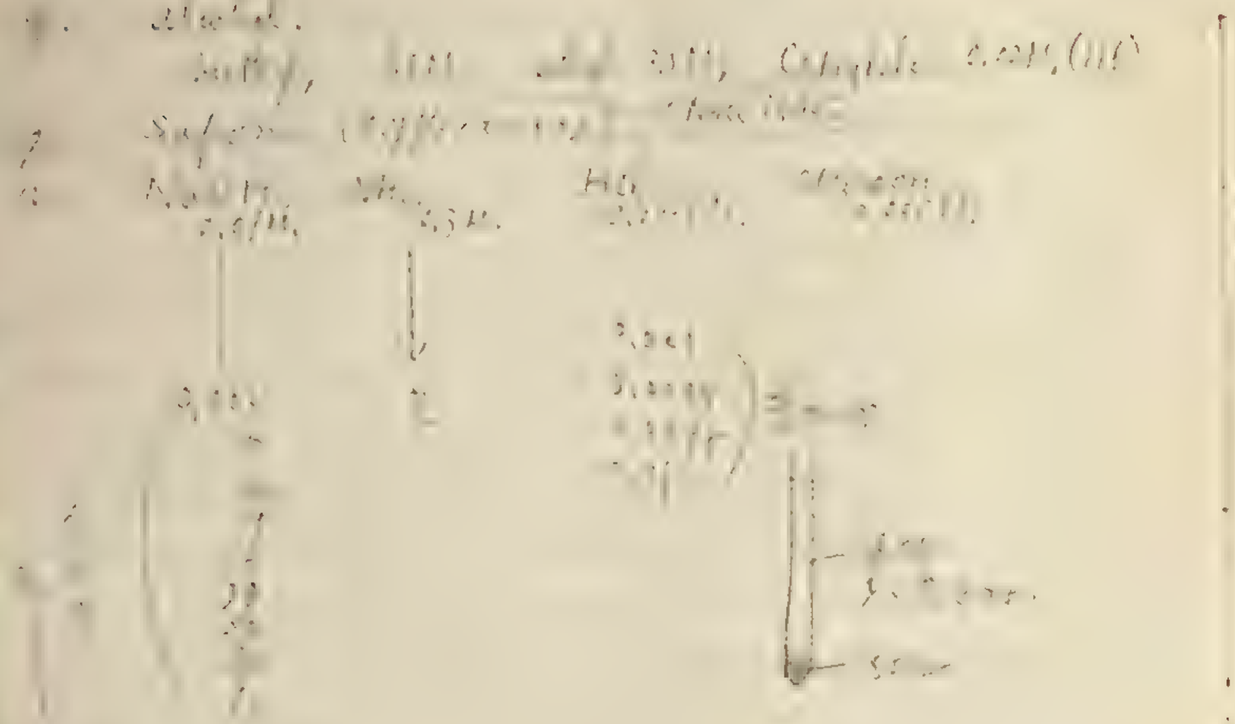
4. Blutgerinnung. Calcium-Ionisation [illegible]

Antikoagulation (Zusammenfassung)

5. Defibrination.

6. Anti-Oxidans.

7. Dosis. Mg [illegible]



Tube 21.

Hamid.

Na, K.

0.45 %

NA

K

/Na + 1/20 mol

1/20 HCl + 1 ml

Narcotica und Ather.

Ca < Mg < Sr < Ba, Cs, Li.

Hypn.

Ni < Ba < Sr < Mg < Ca

Strychnin- Nitration

Na-licarbonat

1.0 ml Na-licarbonat

1 % 0.5 % 0.1 %

2. Strychnine.

0.1, 0.5, 0.05 0.01 0.001, 0.0001 0.00001

3. Strychnine

0.005, 0.001, 0.0005 0.0001 0.00005,

0.00001 %.

Na-carb. 0.1 %.

4 NaCl 0.65, 1.5, 2.0 5.0 %

5 NaCl 0.65 % + 0.0001 % Strychnine.

" 0.65 % + 0.02 % CaCl2 + 0.0001 % Str.

Reaction of frogs to chlorides of
Conc. K. Na. Li.

Conc. Chloride Used

Conc. 2M, 1.5M, 1M, | 0.5M.

1.

Anim 2M ...

...

...

...

2.

NaCl	2M	1.5M	1M	0.5M

3.

2M	KCl	NaCl	CaCl	LiCl
1				
2				
3				
4				
5				

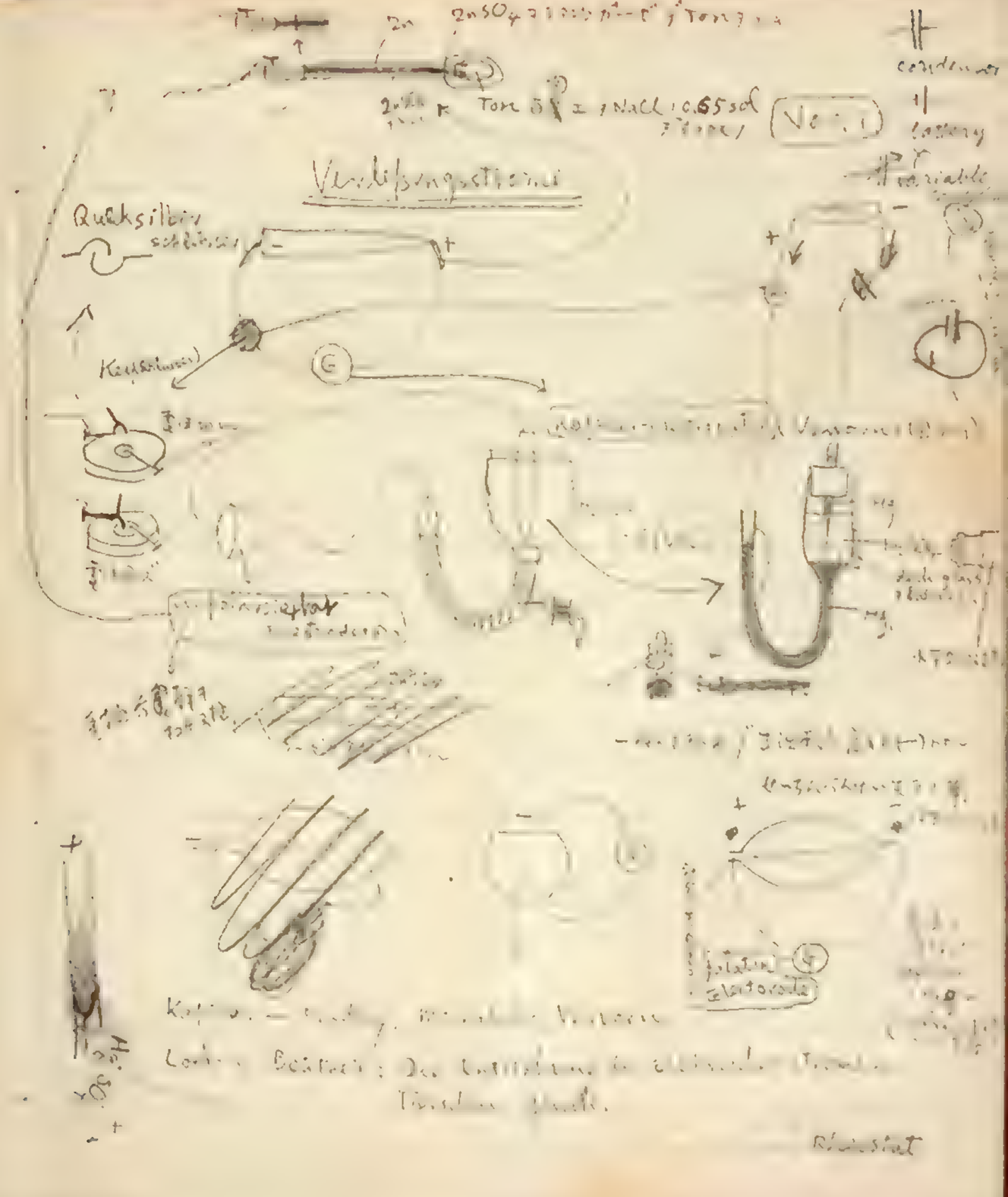
TUBE 2

A. 1 KCl, NaCl, MgCl2

2. NaCl

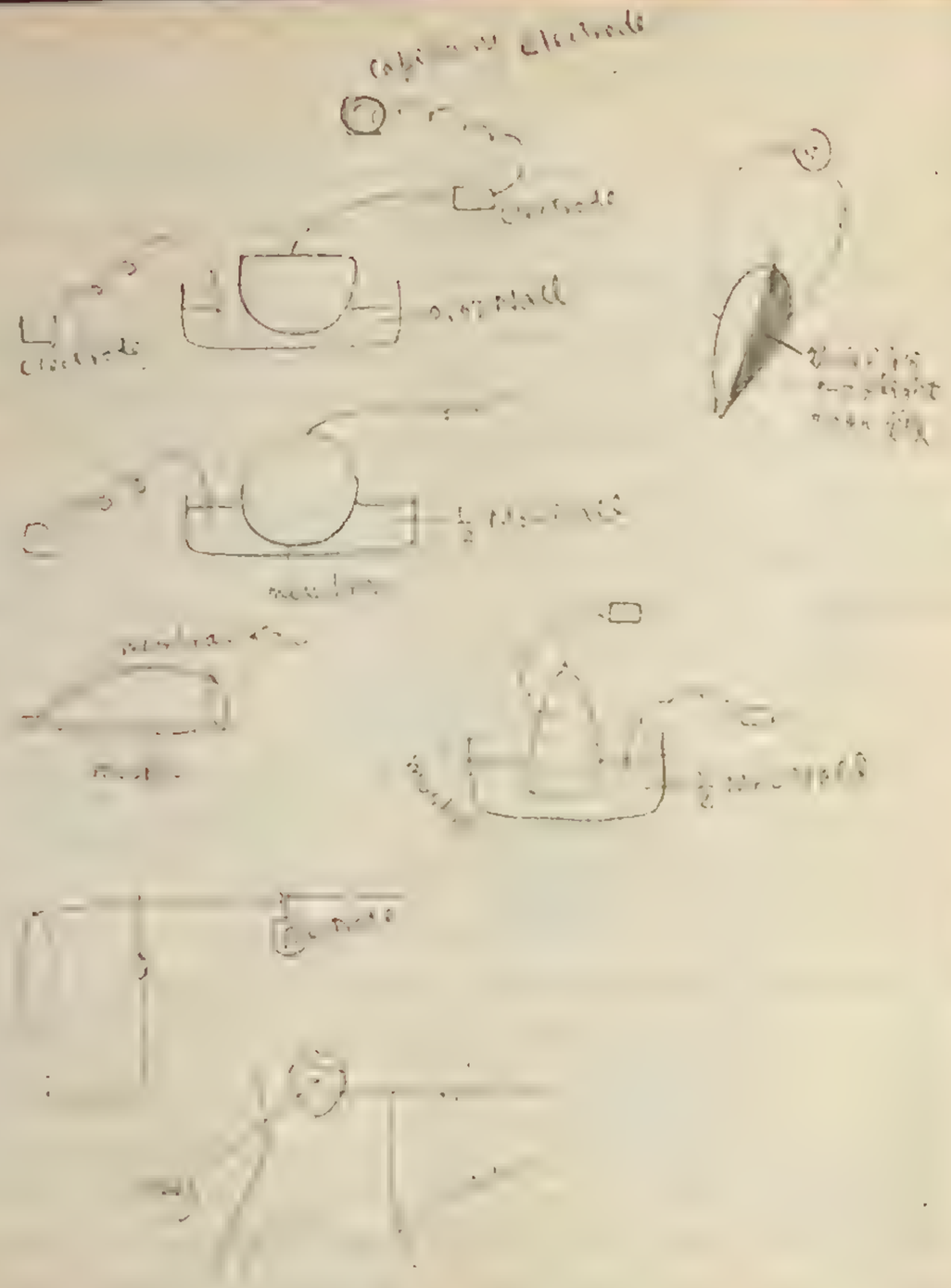
B. Medium

C.


Verbindungsstücke
Quecksilber
Kautschukschlauch
Platinelektrode

No: 2

Aim

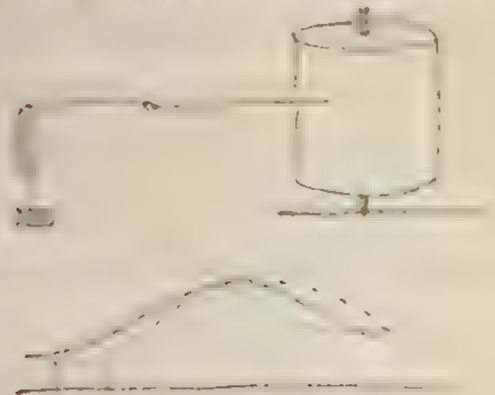


Muskelkontraction

Tag 7 Frosch, M. gastrocnemius

Myogramm 1 Reiz

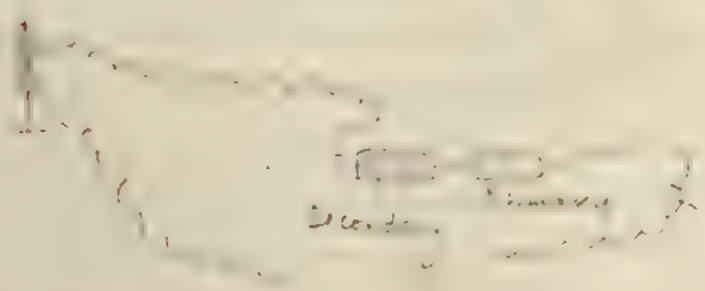
Reiz [illegible] Reiz [illegible]



[illegible]

Tab. 1 Du Bois Reymond'sches Induktorium

2 Stromstärke 1/10 – 1/100 [illegible]



a–b Latenzzeit. Reiz [illegible] Kontraktion [illegible]

b–c Kontraktionsperiode 0,1 sec.

c–d. Elongationsperiode 0,1 sec.

Zuckungsdauer bis d 0,1 sec.

1. Zuckung [illegible]
   Reizstärke [illegible]
   Reiz [illegible]

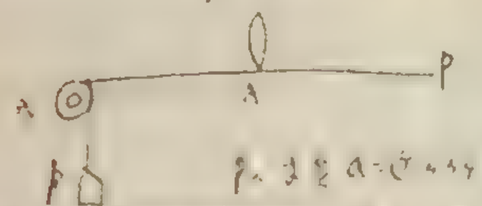
2. Temp.
   – 4° – 40° C Latenzzeit, Zuckungsdauer ↑
   40° – 45° C Wärmestarre

3. Ermüdung [illegible]

4. Lord (Temp.) Einfluss. – [illegible] Zuckung [illegible]
   ad 2. [illegible]

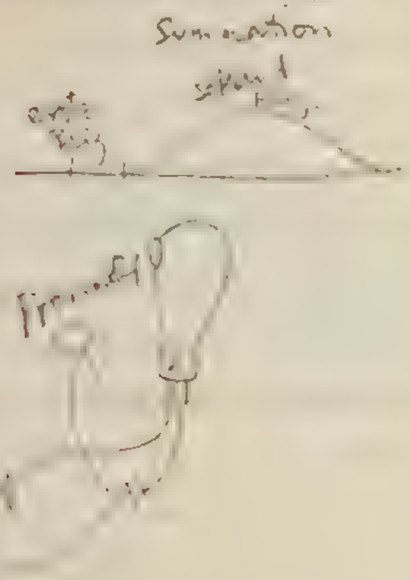
Spannung [illegible] Zuckung [illegible]

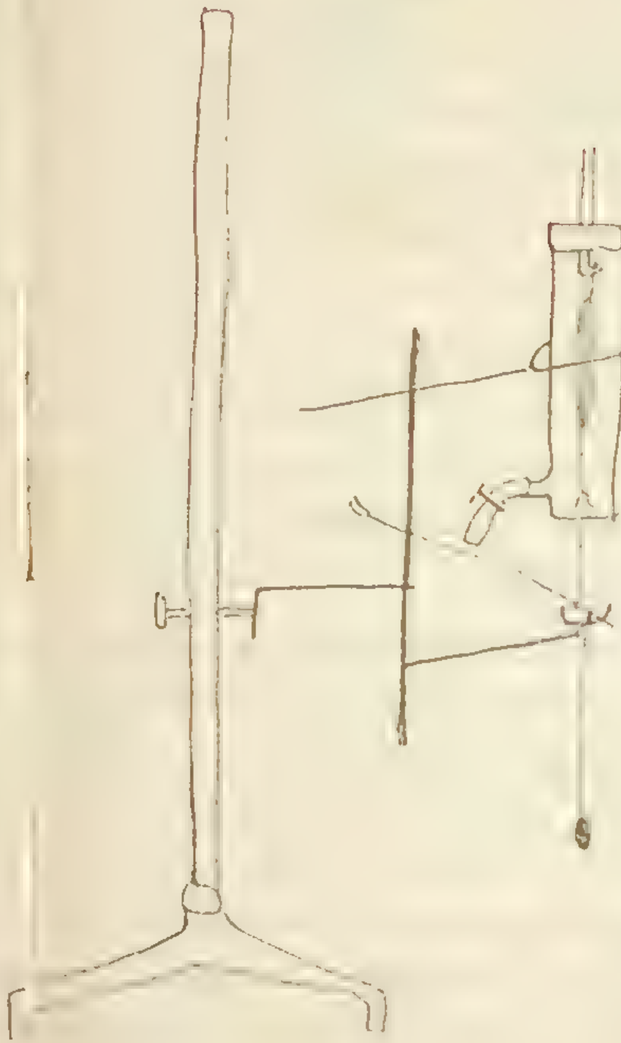
1. Isotonische Zuckung. [illegible]

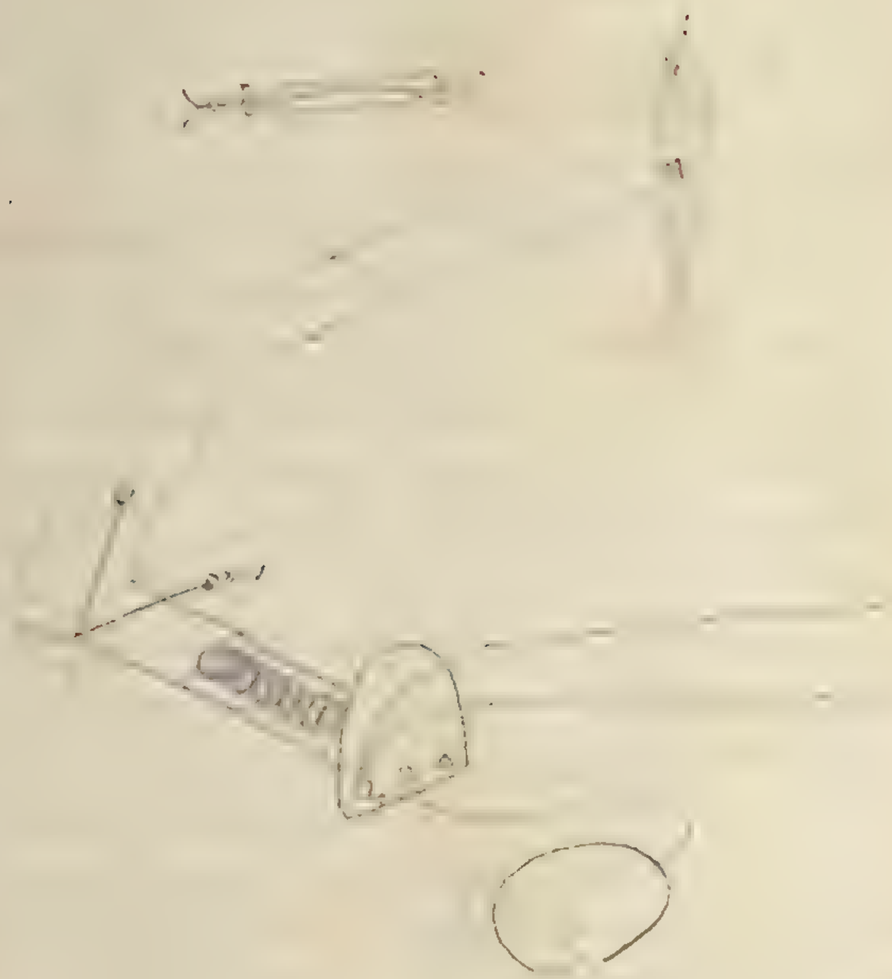


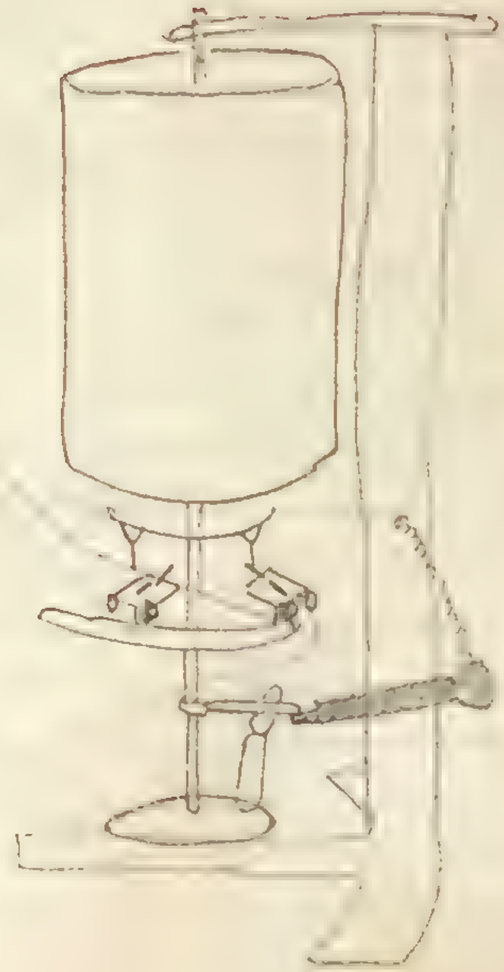
[illegible]

2. Isometrische Zuckung. [illegible]









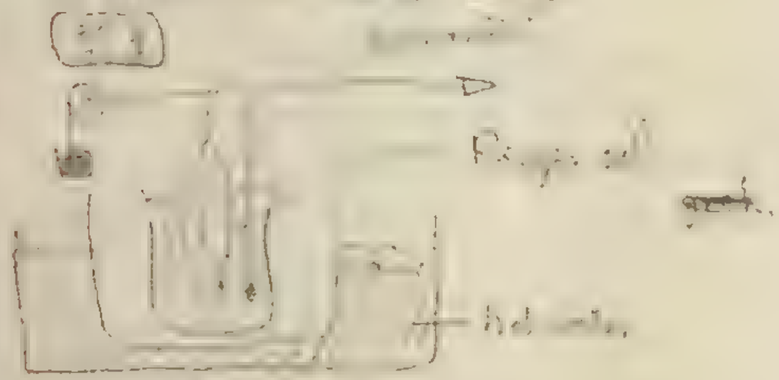
Dec. 13

Heat-coagulation of muscle

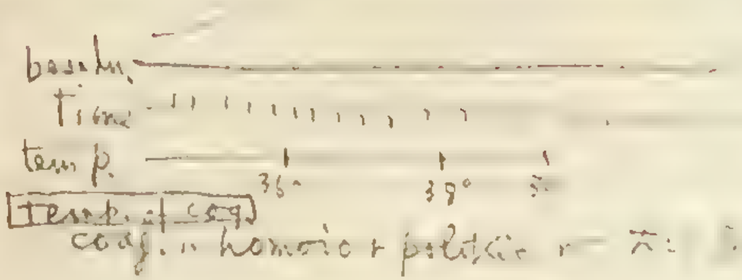
Fracture of Coag.

Coagulation on sol → gel

Section of muscle.



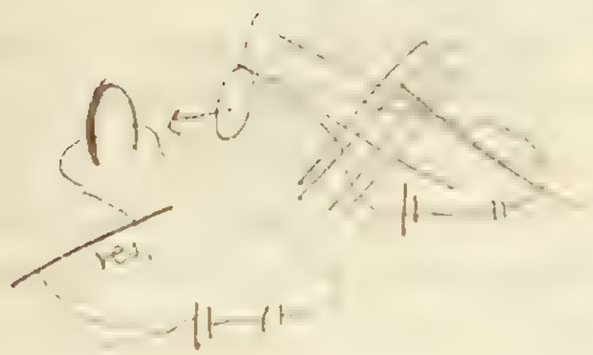
graph

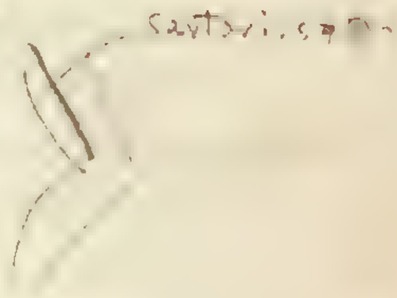


Tensile of Coag.

coag. in homoio + poikilo

Konstantenbestimmung



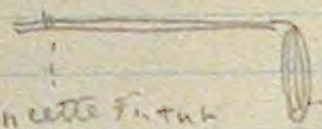


Jan. 17.

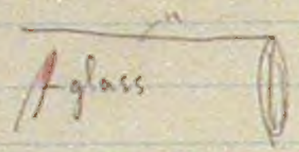
Nerven

1. Periphere Reizung (Verworn p.206)

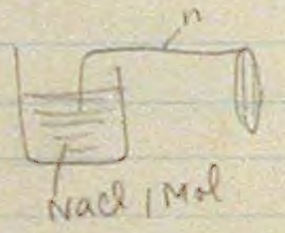
● mechanische Reizung



✕● thermische R.



✕● Osmotische R.



水を等しくzuckenする

✕ chemische R.

◦ Ammonium oxalat

Ca"がCa'に作用するとCa-oxalat
となり神経にCaがCaがとられるので
zuckenする

Concentration — NaCl 0.65% と isotonisch である

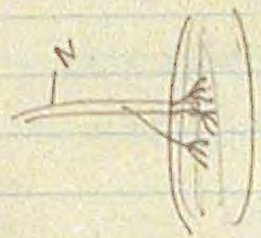
? ammonium oxalat が水を吸収するために、ソルが収縮するから
$\frac{M}{60}$ ～ $\frac{M}{12}$ 位がよいようだ。

Jan. 18.

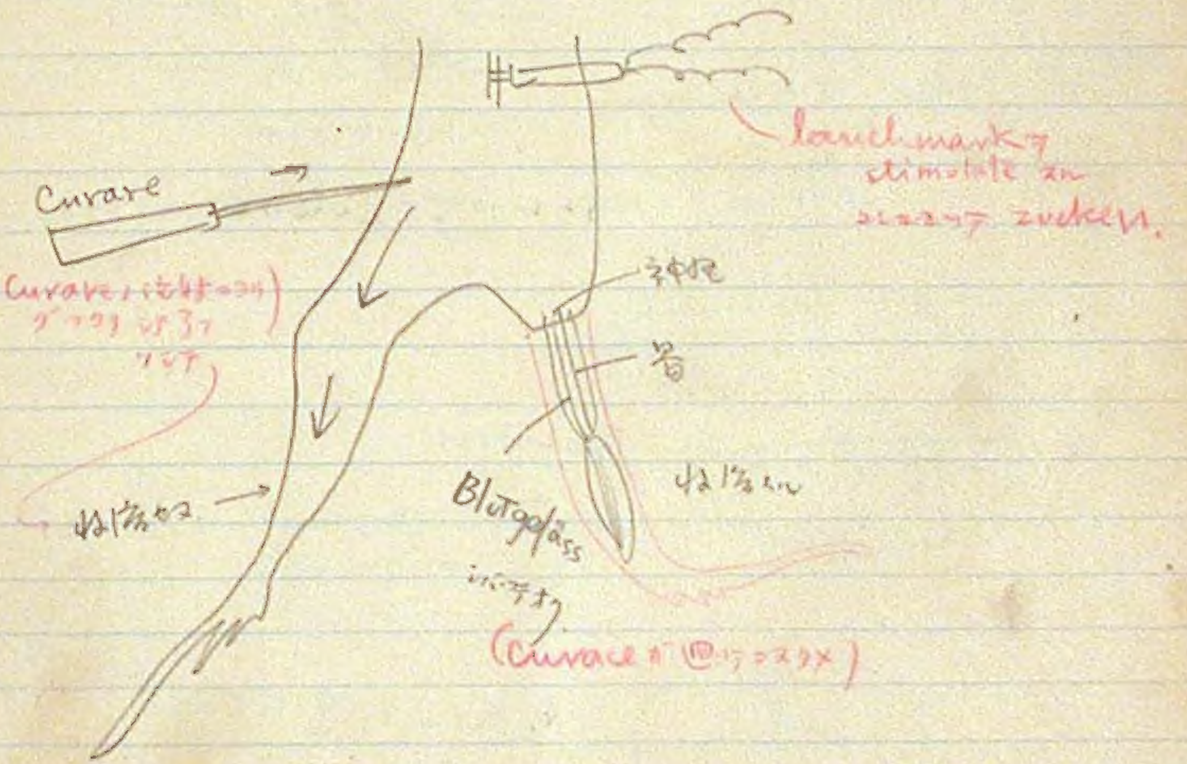
✕ curare-Vergiftung 1%

(トリタブト ウラレン)

一種の alkaloid で神経末端をマヒさせる。
中枢マヒは別名 ⟹ する

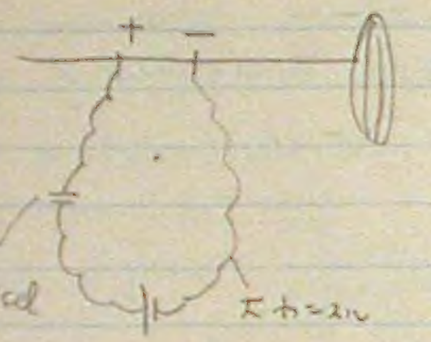


cf. Verworn, S. 150–160
中枢に興奮をだす。



Pflüger's Zuckungsgesetz.

Cf. S. 184. S. 254.

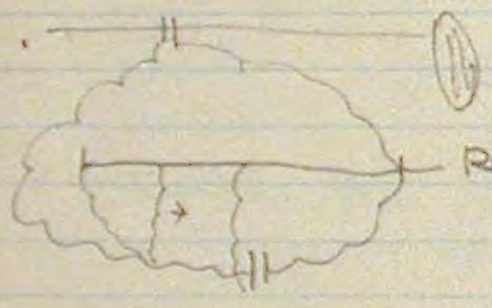


主流ト Nerv. Reiz ガ 向キ ニ ナル
コレ ガ 動物 ノ 場合 ガ ハル

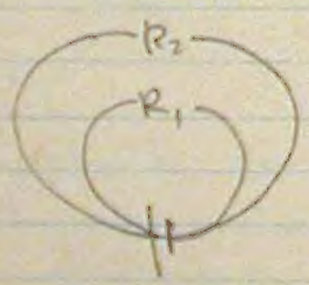
→ stärke ←
→ mittel ←
→ schwach ←

ノ 6 ツ ノ ケース ニ

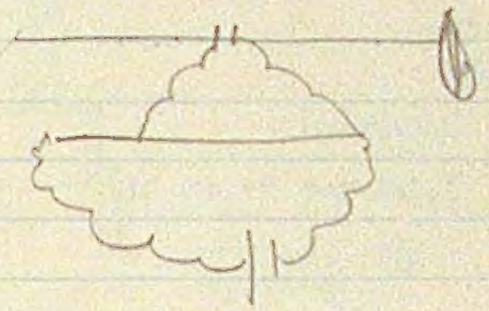
Schlüssel ヲ ソノ ママ ト シ テ ノ 時 ニ Pole ガ カハッテ カラ ヲ ラベル.



ニ ツ ノ ケイデ モ ヨイ



R_1 ト R_2 ヲ 流ス ト キ ニ
ヲ ナ ジ ニ ナル



Jan. 31. & Febr. 1.

glatt — Muskel

Ringer + glucose

Lautzeit

Totanisch 2" Einzel

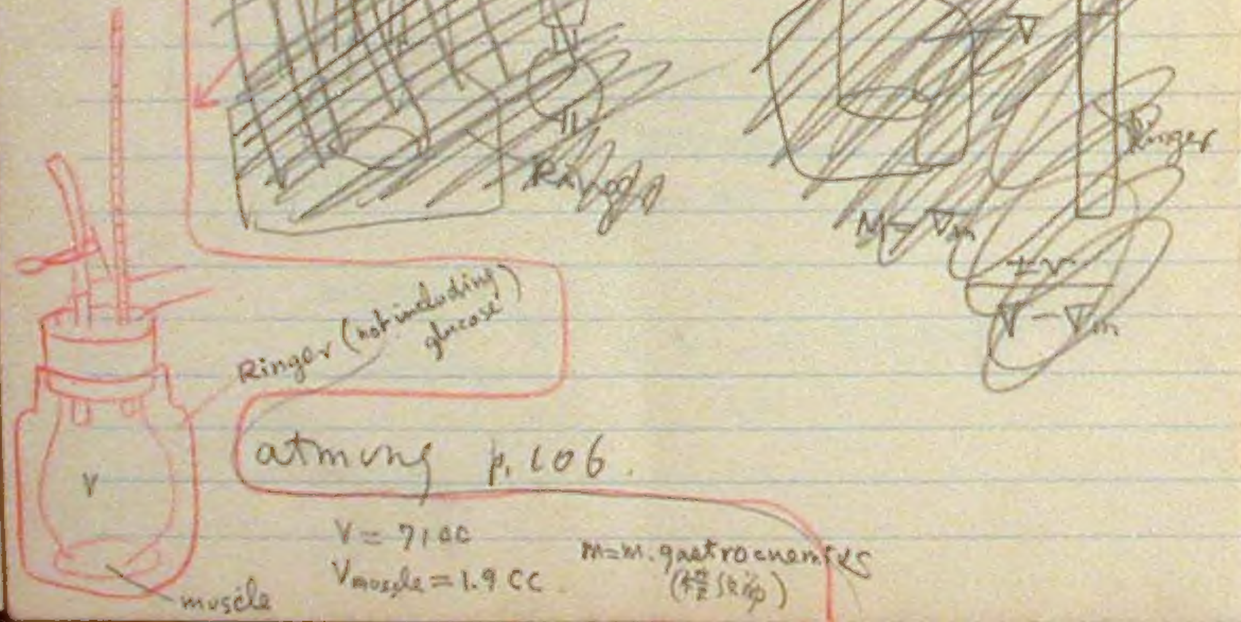
peristaltisch

Time

Volum-veränderung bei der M-kontraktion

trommel = graph 用の2実験.
striated muscle ﾃﾞ ｷｯﾁﾘ横紋ｶﾝ
ｼﾞ ↓ 'quergestreift'

1.



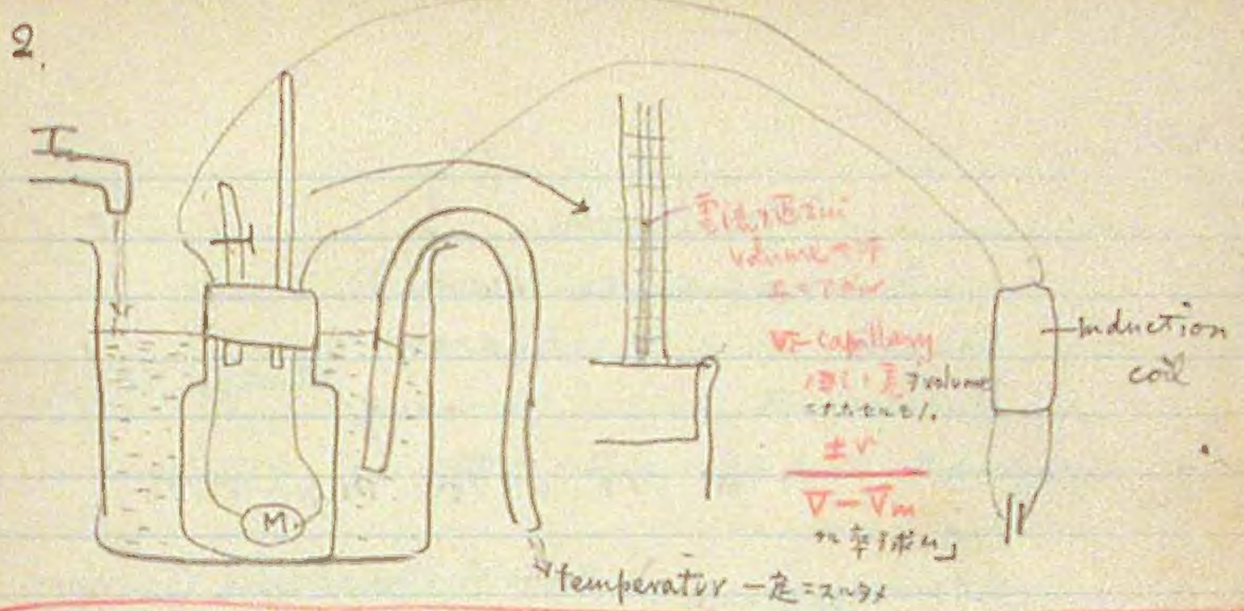
atmung p. 106.

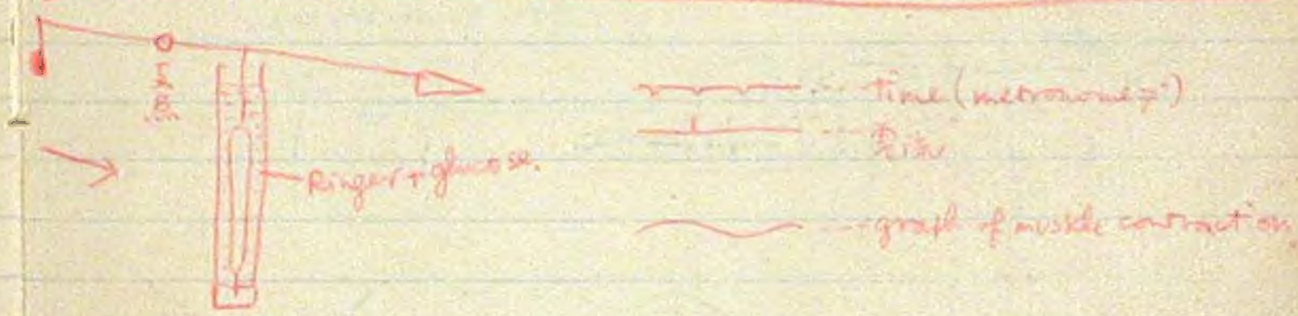
V = 7 cc

V_{muscle} = 1.9 cc

m = m. gastrocnemius (ｶﾌｽﾈ)

2.





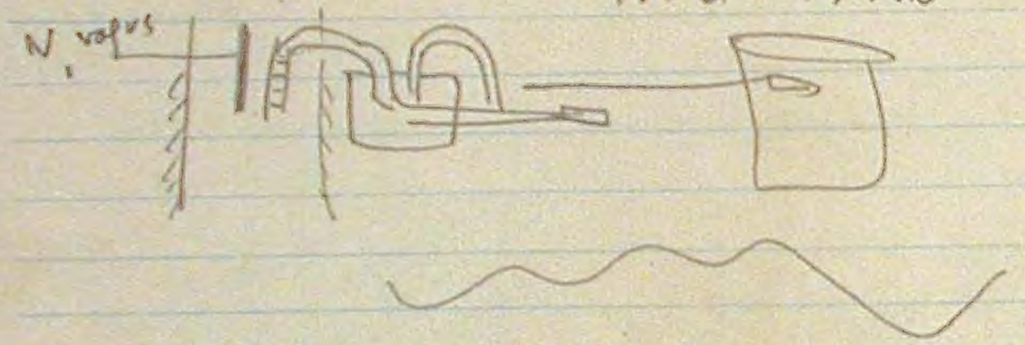
Feb. 21.

Vagus-Nerven
(Parasympathische Nerven)

Sympath ---- Energy
parasympath --- Hemmung } antagonistisch

Sympathe — 内臓. 血管. 汗腺 pupil 拡張

Herz.
atmungsorgane > ~~auto~~ automatische Bewegung
自律運動



Hemmung → atmung 抑制
Peristalsis d. Darm
(腸管蠕動)